

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in this application.

Listing of Claims:

1. (currently amended) A vibrator apparatus for connection to a well tubular member for imparting longitudinal vibrations thereto, said vibrator apparatus comprising:

a vibrator section including a member adapted to be connected to an elongated well tubular member for transferring vibrations thereto; and

a support section ~~interposed~~ disposed between said vibrator section and a wellhead structure for supporting said apparatus on said wellhead structure, said support section including pressure fluid support and isolation members operably supporting said vibrator section, said support and isolation members comprising plural cylinder assemblies; and

a fluid flow circuit including a pump for supplying pressure fluid to said cylinder assemblies, respectively.

2. (currently amended) The apparatus set forth in Claim 1 wherein:

~~said pressure fluid isolation members comprise pressure fluid cylinder and piston assemblies~~ include extensible pistons ~~for absorbing longitudinal vibrations reacted by said vibrator section and~~ for elevating said vibrator section with respect to said wellhead structure.

3. (original) The apparatus set forth in Claim 2 wherein:

said support section includes a flange for mounting said vibrator apparatus on said wellhead structure, a support plate connected to said flange and supporting said cylinder assemblies and said vibrator section includes a frame supported by said cylinder assemblies.

4. (currently amended) The apparatus set forth in Claim 3 wherein:

said support section includes an array of four ~~pressure fluid of said cylinder and piston~~ assemblies mounted on said support plate and arranged in a substantially symmetrical pattern with respect to a central axis of said apparatus, said axis being substantially coincident with a longitudinal central axis of said tubular member.

Claims 5 through 10 (canceled)

11. (currently amended) The apparatus set forth in Claim ~~10~~ 1 including:

a manifold for distributing pressure fluid to and receiving fluid from respective ones of said cylinder assemblies, and flow control devices ~~interposed~~ disposed between said cylinder assemblies and said manifold for effectively causing fluid flow through said cylinder assemblies during operation of said apparatus.

12. (original) The apparatus set forth in Claim 11 wherein:

said fluid flow circuit comprises a hydraulic fluid flow circuit including hydraulic accumulator means operably connected in circuit with said manifold for damping pressure and flow fluctuations in said hydraulic fluid flow circuit.

13. (original) The apparatus set forth in Claim 12 wherein:

said hydraulic fluid flow circuit includes plural accumulators connected in parallel for absorbing said pressure and flow fluctuations, respectively.

14. (original) The apparatus set forth in Claim 1 including:

pressure fluid drive motors operably connected to spaced apart rotatable shafts on said vibrator section, respectively, for rotatably driving said shafts to induce longitudinal vibratory forces imposed on said tubular member.

15. (original) The apparatus set forth in Claim 1 including:

means for supporting said tubular member on said vibrator section for rotation with respect to said vibrator section.

Claims 16 and 17 (canceled)

18. (original) The apparatus set forth in Claim 1 including:

means engageable with said tubular member for rotatably driving said tubular member with respect to said vibrator section while vibrations are imposed on said tubular member by said apparatus.

19. (currently amended) A vibrator apparatus for connection to a well tubular member for imparting longitudinal vibrations thereto, said vibrator apparatus comprising:

a vibrator section including a member adapted to be connected to an elongated well tubular member for transferring vibrations thereto;

a support section ~~interposed~~ disposed between said vibrator section and a wellhead structure for supporting said apparatus on said wellhead structure, said support section including an array of plural pressure fluid cylinder assemblies mounted on said support section and arranged in a substantially symmetrical pattern with respect to a longitudinal axis of said ~~tubing or casing~~ tubular member; and

a pressure fluid circuit including a pump and a manifold for receiving pressure fluid from said pump for distributing pressure fluid to respective ones of said cylinder assemblies and for receiving pressure fluid from said cylinder assemblies, respectively.

20. (currently amended) The apparatus set forth in Claim 19 including:

flow control devices ~~interposed~~ disposed between said cylinder assemblies and said manifold for effectively causing fluid flow through said cylinder assemblies during operation of said apparatus.

21. (original) The apparatus set forth in Claim 19 including:

pressure fluid accumulator means operably in circuit with said manifold for damping pressure and flow fluctuations in said circuit and generated by said cylinder assemblies.

22. (original) The apparatus set forth in Claim 21 wherein:

said circuit includes plural accumulators disposed in parallel in said circuit for absorbing said pressure and flow fluctuations, respectively.

23. (currently amended) The apparatus set forth in Claim 19 including:

pressure fluid drive motors operably connected to respective rotatable shafts, respectively, for rotatably driving said shafts to induce longitudinal vibratory forces imposed on said ~~tubing or casing~~ tubular member.

24. (original) The apparatus set forth in Claim 19 including:

means for supporting said tubular member on said vibrator section for rotation with respect to said vibrator section.

25. (original) The apparatus set forth in Claim 24 wherein:

said means for supporting said tubular member for rotation comprises a bearing support member, a bearing assembly supported by said bearing support member and a member engaged with said bearing assembly for supporting said tubular member with respect to said vibrator section for rotation with respect to said vibrator section.

26. (currently amended) A vibrator apparatus for connection to a well tubular member for imparting longitudinal vibrations thereto, said vibrator apparatus comprising:

a vibrator section including a member adapted to be connected to an elongated well tubular member for transferring vibrations thereto;

a support section ~~interposed~~ disposed between said vibrator section and a wellhead structure for supporting said apparatus on said wellhead structure, said support section

including an array of plural pressure fluid cylinder assemblies mounted on said support section;

a pressure fluid circuit including a pump and a manifold for receiving pressure fluid from said pump for distributing pressure fluid to respective ones of said cylinder assemblies;

flow control devices ~~interposed~~ disposed between said cylinder assemblies and said manifold for effectively causing fluid flow through said cylinder assemblies during operation of said apparatus; and

plural accumulators disposed in parallel communication with said circuit for damping at least one of pressure and flow fluctuations in said circuit.

27. (new) A vibrator apparatus for connection to a well tubular member for imparting longitudinal vibrations thereto, said vibrator apparatus comprising:

a vibrator section including a member adapted to be connected to an elongated well tubular member for transferring vibrations thereto, said vibrator section including a frame including opposed end walls and intermediate walls supporting spaced apart bearing assemblies, spaced apart, substantially parallel rotatable shaft members mounted in said bearing assemblies, respective eccentric weights mounted on said shafts, respectively, and a timing mechanism interconnecting said shafts for rotating said shafts in synchronization with each other to cause said weights to impart longitudinal vibratory forces on said tubular member; and

a support section disposed between said vibrator section and a wellhead structure for supporting said apparatus on said wellhead structure, said support section including pressure fluid support and isolation members operably supporting said vibrator section.

28. (new) The apparatus set forth in Claim 27 wherein:

said shafts each support plural eccentric weights thereon and spaced apart substantially equidistant from a longitudinal central axis of said apparatus and which is substantially coincident with a central axis of said tubular member.

29. (new) The apparatus set forth in Claim 27 wherein:

said timing mechanism comprises gears mounted on said shafts, respectively, and meshed with each other to provide timed rotational movement of said shafts.

30. (new) The apparatus set forth in Claim 27 wherein:

said eccentric weights are supported on said shafts by removable clamp members whereby said eccentric weights may be exchanged for eccentric weights of different mass value.

31. (new) The apparatus set forth in Claim 27 wherein:

said frame includes a part operably connected to said pressure fluid support and isolation members of said support section, a top wall and opposed side walls forming an enclosure and at least a portion of said enclosure provides a chamber for said timing mechanism.

32. (new) A vibrator apparatus for connection to a well tubular member for imparting longitudinal vibrations thereto, said vibrator apparatus comprising:

a vibrator section including a member adapted to be connected to an elongated well tubular member for transferring vibrations thereto;

a support section disposed between said vibrator section and a wellhead structure for supporting said apparatus on said wellhead structure, said support section including pressure fluid support and isolation members operably supporting said vibrator section; and

means for supporting said tubular member on said vibrator section for rotation with respect to said vibrator section comprising a bearing support member, a bearing assembly supported by said bearing support member and a member engaged with said bearing assembly for supporting said tubular member with respect to said vibrator apparatus for rotation with respect to said vibrator apparatus.

33. (new) The apparatus set forth in Claim 32 including:

means for connecting said member supported on said bearing assembly to said bearing support member for retaining said tubular member non-rotatable with respect to said vibrator apparatus.